

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1 1. (Currently Amended) A method for using query signatures to ~~provide~~
2 ~~security for a database~~detect structured query language (SQL) injection,
3 comprising:
4 initializing a signature cache, wherein initializing the signature cache
5 involves:
6 trapping database queries in a controlled environment,
7 parsing the database queries to produce a set of valid signatures,
8 wherein parsing the database queries involves determining signatures for
9 the queries, wherein the signature ~~specifies a structure based on operations~~
10 ~~for the query and is independent of the value of literals in the query~~ SQL
11 keywords contained in the corresponding query with literals removed, and
12 storing the valid signatures in the signature cache;
13 receiving a query at the database;
14 parsing the query at the database to determine a signature for the query,
15 wherein the signature comprises SQL keywords contained in the corresponding
16 query with literals removed~~specifies a structure based on operations for the query~~
17 ~~and is independent of the value of literals in the query and wherein the signature is~~
18 ~~constructed from structured query language (SQL) keywords of the query;~~
19 determining if the signature is located in the signature cache, which
20 contains signatures for valid queries; and

21 if so, processing the query, otherwise, ~~triggering a mismatch~~
22 ~~alert~~ identifying the query as being SQL injected and rejecting the query.

1 2. (Cancelled)

1 3. (Previously Presented) The method of claim 1, wherein the mismatch
2 alert throws an error.

1 4. (Previously Presented) The method of claim 1, wherein the mismatch
2 alert is sent to a database administrator and the query is processed.

1 5. (Previously Presented) The method of claim 1, wherein the mismatch
2 alert is sent to a requesting application, thereby allowing the requesting
3 application to take action.

1 6. (Cancelled)

1 7. (Original) The method of claim 1, wherein if the signature generates a
2 mismatch alert and if the query is a valid query, the method further comprises
3 allowing a database administrator to add the signature to the signature cache.

1 8. (Currently Amended) A computer-readable storage medium storing
2 instructions that when executed by a computer cause the computer to perform a
3 method for using query signatures to ~~provide security for a database~~ detect SQL
4 injection, wherein the computer-readable storage medium includes magnetic and
5 optical storage devices, disk drives, magnetic tape, CDs (compact discs), and
6 DVDs (digital versatile discs or digital video discs), the method comprising:

7 initializing a signature cache, wherein initializing the signature cache
8 involves:
9 trapping database queries in a controlled environment,
10 parsing the database queries to produce a set of valid signatures,
11 wherein parsing the database queries involves determining signatures for
12 the queries, wherein the signature comprises SQL keywords contained in
13 ~~the corresponding query with literals removed~~~~specifies a structure based~~
14 ~~on operations for the query and is independent of the value of literals in~~
15 ~~the query, and~~
16 storing the valid signatures in the signature cache;
17 receiving a query at the database;
18 parsing the query at the database to determine a signature for the query,
19 wherein the signature comprises SQL keywords contained in the corresponding
20 ~~query with literals removed~~~~specifies a structure based on operations for the query~~
21 ~~and is independent of the value of literals in the query and wherein the signature is~~
22 ~~constructed from structured query language (SQL) keywords of the query;~~
23 determining if the signature is located in the signature cache, which
24 contains signatures for valid queries; and
25 if so, processing the query, otherwise, identifying the query as being SQL
26 ~~injected and rejecting the query~~~~triggering a mismatch alert.~~

1 9. (Cancelled)

1 10. (Previously Presented) The computer-readable storage medium of
2 claim 8, wherein the mismatch alert throws an error.

1 11. (Previously Presented) The computer-readable storage medium of
2 claim 8, wherein the mismatch alert is sent to a database administrator and the
3 query is processed.

1 12. (Previously Presented) The computer-readable storage medium of
2 claim 8, wherein the mismatch alert is sent to a requesting application, thereby
3 allowing the requesting application to take action.

1 13. (Cancelled)

1 14. (Original) The computer-readable storage medium of claim 8, wherein
2 if the signature generates a mismatch alert and if the query is a valid query, the
3 method further comprises allowing a database administrator to add the signature
4 to the signature cache.

1 15. (Currently Amended) An apparatus for using query signatures to detect
2 SQL injection~~provide security for a database~~, comprising:
3 an initialization mechanism configured to initialize a signature cache,
4 wherein when initializing the signature cache, the mechanism is configured to:
5 trap database queries in a controlled environment,
6 parse the database queries to produce a set of valid signatures,
7 wherein parsing the database queries involves determining signatures for
8 the queries, wherein the signature ~~specifies a structure based on operations~~
9 ~~for the query and is independent of the value of literals in the~~
10 query comprises SQL keywords contained in the corresponding query with
11 literals removed, and
12 store the valid signatures in the signature cache;
13 a receiving mechanism configured to receive a query at the database;

14 a parsing mechanism configured to parse the query at the database to
15 determine a signature for the query, wherein the signature comprises SQL
16 keywords contained in the corresponding query with literals removed~~specifies a~~
17 ~~structure based on operations for the query and is independent of the value of~~
18 ~~literals in the query and wherein the signature is constructed from structured query~~
19 ~~language (SQL) keywords of the query;~~
20 a matching mechanism configured to determine if the signature is located
21 in the signature cache, which contains signatures for valid queries;
22 a processing mechanism configured to process the query if the signature is
23 located in the signature cache; and
24 an alerting mechanism configured to identify the query as being SQL
25 injected and rejecting the query~~trigger a mismatch alert~~ if the signature is not
26 located in the signature cache.

1 16. (Cancelled)

1 17. (Previously Presented) The apparatus of claim 15, wherein the
2 mismatch alert throws an error.

1 18. (Previously Presented) The apparatus of claim 15, wherein the
2 mismatch alert is sent to a database administrator and the query is processed.

1 19. (Previously Presented) The apparatus of claim 15, wherein the
2 mismatch alert is sent to a requesting application, thereby allowing the requesting
3 application to take action.

1 20. (Cancelled)

1 21. (Original) The apparatus of claim 15, further comprising an adding
2 mechanism configured to allow a database administrator to add the signature to
3 the signature cache if the signature generates a mismatch alert and if the query is a
4 valid query.